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ABSTRACT

To demonstrate a technique used in introductory psychology courses to introduce students to the phenomenon of illusions, workshop attendees at the Conference on Undergraduate Teaching of Psychology were asked to estimate the dimensions of a standard classroom garbage can placed on a table in the front of the room. Participants were asked to estimate the height and diameter of the base of the can in inches and write their estimates on index cards. In a group activity, the median of particpants' estimate of the garbage can's height was determined to be 20 inches, while the median estimate of the diameter of the base was 12 inches. The garbage can was then measured to be 14.5 inches tall and 10 inches in diameter at the base. Participants were then informed that in previous groups similar overestimates of height were also obtained, while estimates of base diameter usually came within an inch of the actual diameter. Groups were then formed among participants to identify at least three explanations for the overestimation. The demonstration offers a useful means of showing students the practical reality of the materials they study in psychology and presents students with a simple line of research that they can pursue without a laboratory or budget. (BCY)

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JC 960 020

The Perception of Familiar Objects

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We involved a group of workshop participants in a demonstration of a real-life illusion. Participants overestimated the height of a classroom garbage can by nearly 50% and considered explanations for this illusion. We discuss how ecologically valid demonstrations of laboratory conceptualizations of illusions can help to generate student interest in and understanding of perception.

We have observed for several years that the height of a classroom garbage can was routinely overestimated when presented spontaneously in class during a lecture on perception. This illusion has been found to be a very powerful one and hence a dramatic illustration of the phenomenon of illusions, especially in the introductory psychology course. Since the garbage can is a common element in the environment it has special teaching advantages over apparatus typically used in laboratory demonstrations. Rather than discussing how we apply our demonstration we involved attendees of our session at the Conference on Undergraduate Teaching of Psychology in the demonstration as if they were students in our introductory psychology classes. Below we describe the demonstration and how it was used to generate discussion about perception.

Workshop Demonstration

The illusion Participants were given an index card and asked to write an estimate of the height in inches of a standard classroom garbage can that was placed on a table at the front of the room. Participants were then asked to estimate the diameter of the base of the can. They were reminded to write their estimates on the card and identify the height and base estimates respectively.

After the responses were written on each card, participants were told that we would proceed to establish the range and median height estimate of the group. Participants were asked to raise a hand if their estimate was under 40 inches. All raised their hand. Participants were asked to lower their hand when they heard an estimate lower or equal to theirs. We then counted slowly in descending order from 40, noting when the first hand was lowered, when half of the hands were down, and when the last hand was lowered. The same procedure was repeated for estimates of the diameter of the base.

We then measured the height and width of the demonstration garbage-can. The median estimate of height was 20 inches. That compared with an actual measurement of 14.5 inches. The median estimate of the base was 12 inches. That compared with an actual measurement of 10 inches. We reported to the group that in several large classes we have found that the median estimate of the height is about 20 inches while the estimate of the base is within an inch of its actual diameter; they significantly overestimate the height but not the base of the garbage can. While we did not calculate the statistical

significance of the effect, the workshop participants seemed to have performed similarly.

Group discussion of the illusion In the next phase of our demonstration we attempted to engage the participants in a discussion about why one might overestimate the height, but not the base, of the garbage can. Participants were asked to pair up or form small groups and identify at least three explanations for the overestimation. After about five minutes the groups were asked to offer some of their explanations. As each was offered a summary phrase was written on a flip chart. Groups were encouraged to note when they had generated similar explanations. We then initiated discussion of the merits of the hypotheses. For example, one group suggested that the object was not one we typically think of in terms of size but another group argued that if that caused the error it should not have been a consistent overestimation and they should have made a similar error in estimating the base. We then encouraged discussion of methods by which the hypotheses could be evaluated. For example, one group hypothesized that the truncated shape may have caused the overestimation and suggested that testing be replicated with a non-truncated can.

After several minutes of discussion we told participants that this was typical of the reaction to this demonstration and that many of their hypotheses were similar to those offered by our students. Subsequently we discussed how the demonstration is a useful means of showing students how the material they study in Psychology has a practical reality and offers students a simple line of research they can pursue without a lab or budget.

Conclusions

The illusion appears to be robust and reliable. Estimates in the workshop and in classes we formally tested averaged nearly one and a half times the actual height. Eighty-seven percent of a recently tested class overestimated the height. Similar results have been informally observed over several years.

Evidence of the power of the garbage can illusion provides a convincing argument for its use as a teaching demonstration. The naturalness and spontaneity involved in the use of a classroom garbage can dramatically illustrates the unreliability of human perception for "real world" objects customarily found in the environment.

The use of ecologically valid examples of illusions can help to generate student interest and understanding of the influence of illusions on perception. Several textbooks we reviewed provide the reader with examples of real-life illusions. Similarly, several instructor's manuals offer suggestions for discussions about real-life examples. While a discussion of the moon illusion or why fog might distort a pilots sense of depth is interesting, it does not provide students with immediate concrete personal experience with the illusions. The garbage can illusion simply demonstrates how objects students encounter on a daily basis might be misinterpreted by their perceptual systems. The demonstration is thereby very successful in generating interest and discussion about illusions.